



DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 39

**[Docket No. FAA-2023-1412; Project Identifier MCAI-2022-01588-E; Amendment
39-22562; AD 2023-20-03]**

RIN 2120-AA64

Airworthiness Directives; Austro Engine GmbH Engines

AGENCY: Federal Aviation Administration (FAA), DOT.

ACTION: Final rule.

SUMMARY: The FAA is adopting a new airworthiness directive (AD) for certain Austro Engine GmbH Model E4 and E4P engines. This AD is prompted by reports of piston failures and the determination that certain batches of pistons were manufactured with a dimensional deviation in the piston pin bore and piston diameter. This AD requires repetitive engine oil analysis for aluminum content outside the acceptable limits and, if necessary, replacement of the pistons, piston rings, con-rods assembly, and crankcase or, as an alternative, replacement of the engine core. The FAA is issuing this AD to address the unsafe condition on these products.

DATES: This AD is effective [INSERT DATE 35 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER].

The Director of the Federal Register approved the incorporation by reference of a certain publication listed in this AD as of [INSERT DATE 35 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER].

ADDRESSES:

AD Docket: You may examine the AD docket at [regulations.gov](https://www.regulations.gov) under Docket No.FAA-2023-1412; or in person at Docket Operations between 9 a.m. and 5 p.m., Monday

through Friday, except Federal holidays. The AD docket contains this final rule, the mandatory continuing airworthiness information (MCAI), any comments received, and other information. The address for Docket Operations is U.S. Department of Transportation, Docket Operations, M-30, West Building Ground Floor, Room W12-140, 1200 New Jersey Avenue SE, Washington, DC 20590.

Material Incorporated by Reference:

- For service information identified in this final rule, contact Austro Engine GmbH, Rudolf-Diesel-Strasse 11, A-2700 Weiner Neustadt, Austria; phone: +43 2622 23000; website: austroengine.at.
- You may view this service information at the FAA, Airworthiness Products Section, Operational Safety Branch, 1200 District Avenue, Burlington, MA 01803. For information on the availability of this material at the FAA, call (817) 222-5110. It is also available at regulations.gov under Docket No. FAA-2023-1412.

FOR FURTHER INFORMATION CONTACT: Barbara Caufield, Aviation Safety Engineer, FAA, 1600 Stewart Avenue, Suite 410, Westbury, NY 11590; phone: (781) 238-7146; email: barbara.caufield@faa.gov.

SUPPLEMENTARY INFORMATION:

Background

The FAA issued a notice of proposed rulemaking (NPRM) to amend 14 CFR part 39 by adding an AD that would apply to certain Austro Engine GmbH Model E4 and E4P engines. The NPRM published in the *Federal Register* on July 14, 2023 (88 FR 45118). The NPRM was prompted by European Union Aviation Safety Agency (EASA) AD 2022-0240R1, dated December 15, 2022 (referred to after this as the MCAI), issued by EASA, which is the Technical Agent for the Member States of the European Union. The MCAI states that a manufacturer investigation into reports of piston failures determined that certain batches of pistons were manufactured with a dimensional deviation in the

piston pin bore and in the piston diameter, which could cause piston failure, with consequent loss of oil, loss of engine power, and reduced control of the airplane. To address the unsafe condition, EASA issued EASA AD 2022-0240, dated December 6, 2022 (EASA AD 2022-0240), to specify repetitive oil analyses and replacement of the pistons, piston rings, con-rods assembly, and crankcase, or as an alternative, replacement of the engine core. EASA AD 2022-0240 also prohibited release to service of an airplane until receipt of the results for each oil analysis.

Since EASA AD 2022-0240 was issued, the manufacturer determined that aluminum levels outside of the acceptable limits would be found during the first oil analysis, and are unlikely to be found during subsequent oil analyses. As a result, EASA revised EASA AD 2022-0240 and issued the MCAI to allow release to service of airplanes for a limited number of flight hours immediately after the second and subsequent oil samples are taken for analyses.

In the NPRM, the FAA proposed to require initial and repetitive engine oil analysis for aluminum content outside the acceptable limits and, if necessary, replacement of the pistons, piston rings, con-rods assembly, and crankcase, or as an alternative, replacement of the engine core. The FAA is issuing this AD to address the unsafe condition on these products.

You may examine the MCAI in the AD docket at [regulations.gov](https://www.regulations.gov) under Docket No. FAA-2023-1412.

Discussion of Final Airworthiness Directive

Comments

The FAA received no comments on the NPRM or on the determination of the costs.

Conclusion

These products have been approved by the aviation authority of another country and are approved for operation in the United States. Pursuant to the FAA's bilateral agreement with this State of Design Authority, it has notified the FAA of the unsafe condition described in the MCAI referenced above. The FAA reviewed the relevant data and determined that air safety requires adopting this AD as proposed. Accordingly, the FAA is issuing this AD to address the unsafe condition on these products. Except for minor editorial changes, this AD is adopted as proposed in the NPRM.

Related Service Information under 1 CFR Part 51

The FAA reviewed Austro Engine GmbH Mandatory Service Bulletin No. MSB-E4-039/1, Revision 1, dated April 24, 2023, which specifies procedures for oil analysis and replacement of the pistons, piston rings, con-rods assembly, crankcase, and engine core.

This service information is reasonably available because the interested parties have access to it through their normal course of business or by the means identified in ADDRESSES.

Costs of Compliance

The FAA estimates that this AD affects 357 engines installed on airplanes of U.S. registry.

The FAA estimates the following costs to comply with this AD:

Estimated costs

Action	Labor Cost	Parts Cost	Cost per product	Cost on U.S. operators
Oil Analysis	.25 work-hours x \$85 per hour = \$21.25	\$0	\$21.25	\$7,586.25

The FAA estimates the following costs to do any necessary replacements that would be required based on the results of the inspection. The agency has no way of determining the number of aircraft that might need these replacements:

On-condition costs

Action	Labor Cost	Parts Cost	Cost per product
Replace engine core	50 work-hours x \$85 per hour = \$4,250	\$15,524	\$19,774
Replace pistons, piston rings, and con-rods assembly	60 work-hours x \$85 per hour = \$5,100	\$2,216	\$7,316
Replace pistons, piston rings, con-rods assembly, and crankcase	70 work-hours x \$85 per hour = \$5,950	\$4,141	\$10,091

The FAA has included all known costs in its cost estimate. According to the manufacturer, however, some of the costs of this AD may be covered under warranty, thereby reducing the cost impact on affected operators.

Authority for this Rulemaking

Title 49 of the United States Code specifies the FAA's authority to issue rules on aviation safety. Subtitle I, section 106, describes the authority of the FAA Administrator. Subtitle VII: Aviation Programs, describes in more detail the scope of the Agency's authority.

The FAA is issuing this rulemaking under the authority described in Subtitle VII, Part A, Subpart III, Section 44701: General requirements. Under that section, Congress charges the FAA with promoting safe flight of civil aircraft in air commerce by prescribing regulations for practices, methods, and procedures the Administrator finds necessary for safety in air commerce. This regulation is within the scope of that authority because it addresses an unsafe condition that is likely to exist or develop on products identified in this rulemaking action.

Regulatory Findings

This AD will not have federalism implications under Executive Order 13132. This AD will not have a substantial direct effect on the States, on the relationship between the national government and the States, or on the distribution of power and responsibilities among the various levels of government.

For the reasons discussed above, I certify that this AD:

- (1) Is not a “significant regulatory action” under Executive Order 12866,
- (2) Will not affect intrastate aviation in Alaska, and
- (3) Will not have a significant economic impact, positive or negative, on a substantial number of small entities under the criteria of the Regulatory Flexibility Act.

List of Subjects in 14 CFR Part 39

Air transportation, Aircraft, Aviation safety, Incorporation by reference, Safety.

The Amendment

Accordingly, under the authority delegated to me by the Administrator, the FAA amends 14 CFR part 39 as follows:

PART 39 - AIRWORTHINESS DIRECTIVES

1. The authority citation for part 39 continues to read as follows:

Authority: 49 U.S.C. 106(g), 40113, 44701.

§ 39.13 [Amended]

2. The FAA amends § 39.13 by adding the following new airworthiness directive:

2023-20-03 Austro Engine GmbH: Amendment 39-22562; Docket No. FAA-2023-1412; Project Identifier MCAI-2022-01588-E.

(a) Effective Date

This airworthiness directive (AD) is effective [INSERT DATE 35 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER].

(b) Affected ADs

None.

(c) Applicability

This AD applies to Austro Engine GmbH Model E4 and E4P engines with a serial number listed in Tables 1, 2, 3, and 4 of Austro Engine GmbH Mandatory Service Bulletin No. MSB-E4-039/1, Revision 1, dated April 24, 2023 (MSB-E4-039/1).

(d) Subject

Joint Aircraft System Component (JASC) Codes 8530, Reciprocating Engine Cylinder Section; 8550, Reciprocating Engine Oil System.

(e) Unsafe Condition

This AD was prompted by reports of piston failures and the determination that certain batches of pistons were manufactured with a dimensional deviation in the piston pin bore and piston diameter. The FAA is issuing this AD to prevent piston failure. The unsafe condition, if not addressed, could result in loss of oil, loss of engine power, and reduced control of the airplane.

(f) Compliance

Comply with this AD within the compliance times specified, unless already done.

(g) Required Actions

(1) For all affected engines, within the applicable compliance times specified in Table 1 to paragraph (g)(1) of this AD, perform an oil analysis in accordance with paragraph 2., Technical Details, Engine Oil Analysis of MSB-E4-039/1, and do not return the engine to service until the results of the oil analysis have been determined.

Table 1 to Paragraph (g)(1) - Oil Analysis for All Affected Engines

Engine Group	Compliance Time	Interval
Group 1 and Group 3	Within 15 flight hours (FHs) from the effective date of this AD	Before exceeding 50 FHs since last oil analysis.
Group 2 and Group 4	Within 25 FHs from the effective date of this AD	Before exceeding 100 FHs since last oil analysis.

(2) Thereafter, repeat the oil analysis required by paragraph (g)(1) of this AD before exceeding the applicable interval specified in Table 1 to paragraph (g)(1) of this AD.

(3) Following each repetitive oil analysis, the engine may be returned to service for no more than the applicable interval specified in Table 1 to paragraph (g)(1) of this AD, until receipt of the oil analysis result.

(4) If the result of any oil analysis required by paragraph (g)(1) of this AD indicates the aluminum content of the oil is greater than the limit specified in paragraph 2., Technical Details, Engine Oil Analysis, Table 5 - Oil check analysis - Aluminum PPM allowable of MSB-E4-039/1, before further flight, replace the pistons, piston rings, con-rods assembly, and crankcase, or replace the engine core in accordance with paragraph 2., Technical Details, Engine core replacement; or Pistons, piston rings, crankcase and con-rod assy replacement; as applicable, of MSB-E4-039/1.

(5) For Group 3 and Group 4 engines, within the applicable compliance times specified in Table 2 to paragraph (g)(5) of this AD, replace the pistons, piston rings, and con-rods assembly, or replace the engine core in accordance with paragraph 2., Technical Details, Engine core replacement; or Pistons, piston rings and con-rod assy replacement, as applicable, of MSB-E4-039/1.

Table 2 to Paragraph (g)(5) - Replacement for Groups 3 and 4 Engines

Engine Group	Compliance Time
Group 3	Before exceeding 900 FHs since new, or within 15 FHs after the effective date of this AD, whichever occurs later.
Group 4	Before exceeding 1,000 FHs since new, or within 25 FHs after the effective date of this AD, whichever occurs later.

Note 1 to paragraph (g)(5): FHs since new indicated in Table 2 to paragraph (g)(5) of this AD are FHs accumulated by the engine since first installation on an airplane or since last overhaul as of the effective date of this AD.

(h) Terminating Action

(1) Replacement of the pistons, piston rings, con-rods assembly, and crankcase, or replacement of the engine core, as specified in paragraph (g)(4) of this AD, constitutes terminating action for the repetitive oil analysis required by paragraph (g)(2) of this AD.

(2) Replacement of the pistons, piston rings, and con-rods assembly, or replacement of the engine core, as specified in paragraph (g)(5) of this AD, constitutes terminating action for the repetitive oil analysis required by paragraph (g)(2) of this AD.

(i) Definitions

(1) For the purpose of this AD, Group 1 engines are engines having a serial number (S/N) listed in Table 1 of MSB-E4-039/1.

(2) For the purpose of this AD, Group 2 engines are engines having an S/N listed in Table 2 of MSB-E4-039/1.

(3) For the purpose of this AD, Group 3 engines are engines having an S/N listed in Table 3 of MSB-E4-039/1.

(4) For the purpose of this AD, Group 4 engines are engines having an S/N listed in Table 4 of MSB-E4-039/1.

(j) Credit for Previous Actions

You may take credit for the actions required by paragraph (g)(1), (4), or (5) of this AD, if you performed those actions before the effective date of this AD using Austro Engine Mandatory Service Bulletin MSB-E4-039/0, dated October 24, 2022.

(k) Alternative Methods of Compliance (AMOCs)

(1) The Manager, International Validation Branch, FAA, has the authority to approve AMOCs for this AD, if requested using the procedures found in 14 CFR 39.19. In accordance with 14 CFR 39.19, send your request to your principal inspector or local Flight Standards District Office, as appropriate. If sending information directly to the

manager of the International Validation Branch, send it to the attention of the person identified in paragraph (l)(2) of this AD and email to: ANE-AD-AMOC@faa.gov.

(2) Before using any approved AMOC, notify your appropriate principal inspector, or lacking a principal inspector, the manager of the local flight standards district office/certificate holding district office.

(l) Additional Information

(1) Refer to European Union Aviation Safety Agency (EASA) AD 2022-0240R1, dated December 15, 2022, for related information. This EASA AD may be found in the AD docket at regulations.gov under Docket No. FAA-2023-1412.

(2) For more information about this AD, contact Barbara Caufield, Aviation Safety Engineer, FAA, 1600 Stewart Avenue, Suite 410, Westbury, NY 11590; phone: (781) 238-7146; email: barbara.caufield@faa.gov.

(m) Material Incorporated by Reference

(1) The Director of the Federal Register approved the incorporation by reference of the service information listed in this paragraph under 5 U.S.C. 552(a) and 1 CFR part 51.

(2) You must use this service information as applicable to do the actions required by this AD, unless the AD specifies otherwise.

(i) Austro Engine GmbH Mandatory Service Bulletin No. MSB-E4-039/1, Revision 1, dated April 24, 2023.

(ii) [Reserved]

(3) For service information identified in this AD, contact Austro Engine GmbH, Rudolf-Diesel-Strasse 11, A-2700 Weiner Neustadt, Austria; phone: +43 2622 23000; website: austroengine.at.

(4) You may view this service information at the FAA, Airworthiness Products Section, Operational Safety Branch, 1200 District Avenue, Burlington, MA 01803. For information on the availability of this material at the FAA, call (817) 222-5110.

(5) You may view this material at the National Archives and Records Administration (NARA). For information on the availability of this material at NARA, visit www.archives.gov/federal-register/cfr/ibr-locations or email fr.inspection@nara.gov.

Issued on October 20, 2023.

Ross Landes, Deputy Director for Regulatory Operations,
Compliance & Airworthiness Division,
Aircraft Certification Service.

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